

WHAT IS CLAIMED IS:

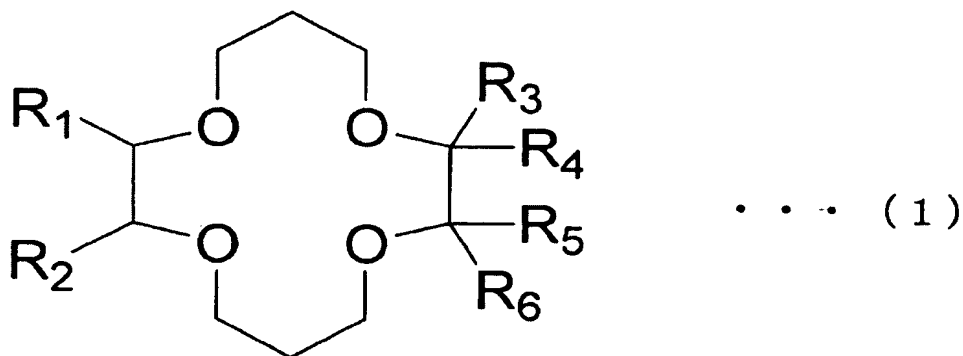
1. A method for controlling concentration of a water treatment chemical, comprising

- 5 adding a water-soluble lithium salt as a tracer substance along with the water treatment chemical to water to be treated; electrochemically or optically measuring concentration of lithium ions using a lithium ion sensitive substance; and
- 10 using the measured lithium ion concentration to control the concentration of the water treatment chemical added to the water to be treated.

2. A method as defined in Claim 1, wherein the lithium ion concentration is measured by detecting a membrane potential indicated by a lithium ion electrode incorporating a sensitive
- 15 membrane including the lithium ion sensitive substance.

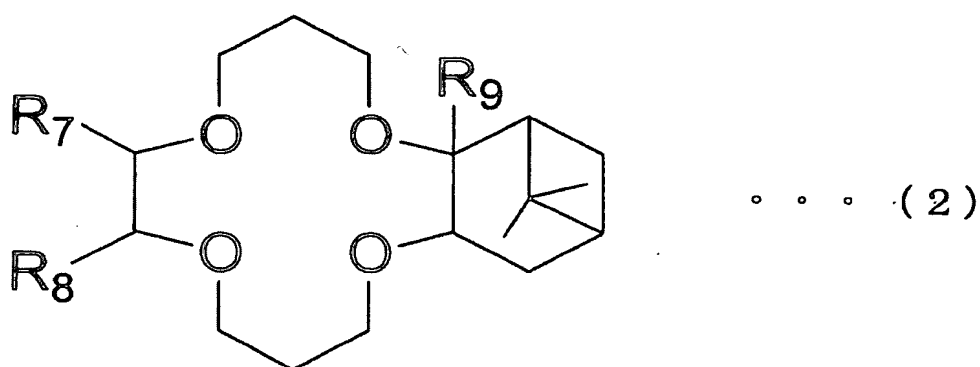
3. A method as defined in Claim 2, wherein the lithium ion sensitive substance is a compound denoted by chemical formula (1)

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wherein R_1 and R_2 are independent from one another, each consisting one of hydrogen atom, alkyl group, benzyl group, benzyloxymethyl group, phenyl group, or cyclohexyl group, and each of R_3 - R_6 is
5 an independent hydrocarbon group.

4. A method as defined in Claim 2, wherein the lithium ion sensitive substance is a compound denoted by chemical formula (2)



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wherein each of R_7 - R_9 is an independent hydrogen atom or hydrocarbon group, while at least one of R_7 - R_9 is a hydrocarbon group.

15 5. A method as defined in Claim 1, wherein the lithium ion concentration is measured by detecting a change in a value of current flowing in a field effect transistor incorporating the lithium ion sensitive substance.

20 6. A method as defined in Claim 1, wherein the lithium ion concentration is measured by detecting an optical characteristic indicated by a membrane incorporating the lithium ion sensitive substance and a fluorescent or light-absorbing substance.

7. A method as defined in Claim 1, wherein the water-soluble lithium salt is added so that the lithium ion concentration in the water to be treated is within the range of 0.01-20 mg/liter.

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8. An apparatus for controlling concentration of a water treatment chemical, comprising

a lithium ion sensitive substance placed in contact with water to be treated;

10 a transducer for converting a state of the sensitive substance into an electric or optical signal;

an arithmetic section for receiving the signal and calculating a concentration of the water treatment chemical; and

15 a control section for determining, based on the calculated water treatment chemical concentration, an amount of the water treatment chemical to be added to the water to be treated.

9. An apparatus as defined in Claim 8, wherein

20 a sensitive membrane is formed including the lithium ion sensitive substance; and

the sensitive membrane and the transducer constitute a lithium ion electrode.

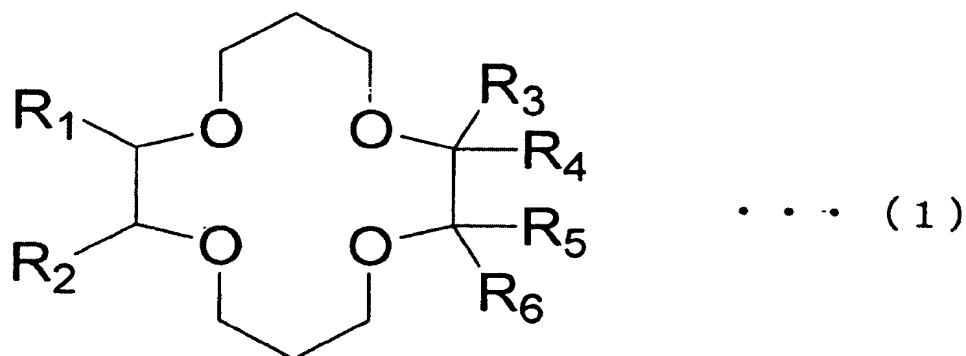
10. An apparatus as defined in Claim 9, wherein the lithium ion electrode includes a light-shielding cover which covers at least the sensitive membrane.

11. An apparatus as defined in Claim 9, wherein lithium ion concentration within the water to be treated is measured by

detecting a membrane potential indicated by the sensitive membrane.

12. An apparatus as defined in Claim 8, wherein the lithium ion sensitive substance is a compound denoted by chemical formula

5 (1)

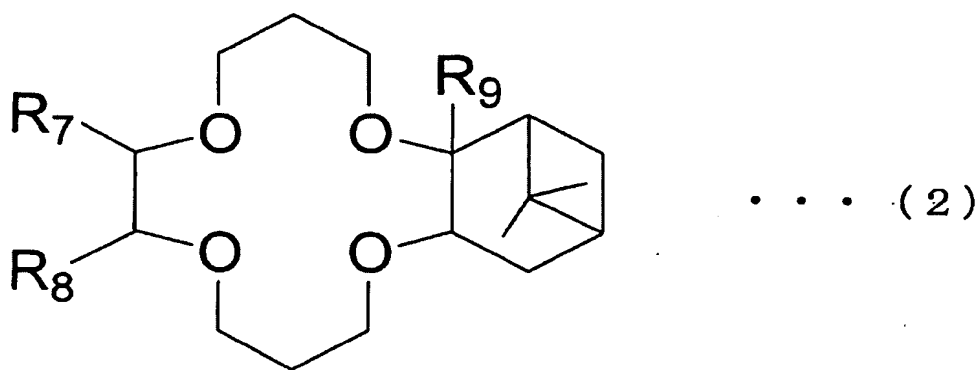


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wherein R₁ and R₂ are independent from one another, each consisting of one of hydrogen atom, alkyl group, benzyl group, benzyloxymethyl group, phenyl group, or cyclohexyl group, and each of R₃-R₆ is an independent hydrocarbon group.

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13. An apparatus as defined in Claim 8, wherein the lithium ion sensitive substance is a compound denoted by chemical formula (2)



wherein each of R₇-R₉ is an independent hydrogen atom or hydrocarbon group, while at least one of R₇-R₉ is a hydrocarbon group.

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14. An apparatus as defined in Claim 8, wherein lithium ion concentration is measured by detecting a change in a value of current flowing in a field effect transistor incorporating the lithium ion sensitive substance.

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15. An apparatus as defined in Claim 8, wherein lithium ion concentration is measured by detecting an optical characteristic indicated by a membrane incorporating the lithium ion sensitive substance and a fluorescent or light-absorbing substance.

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